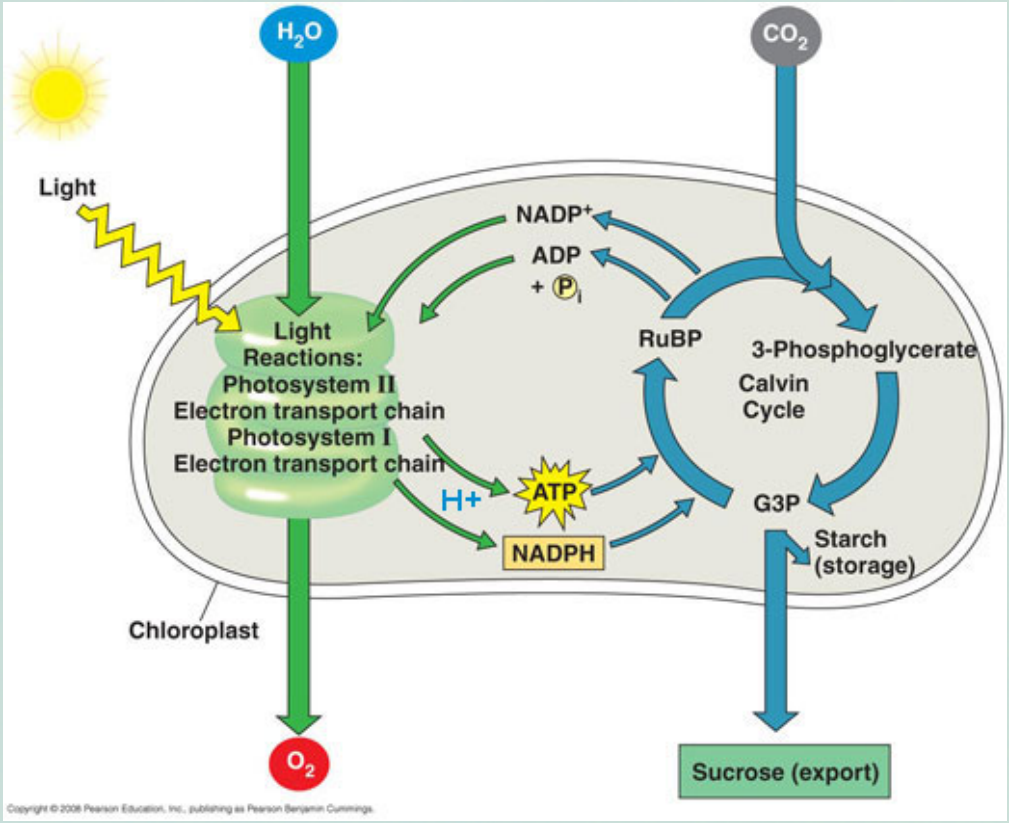
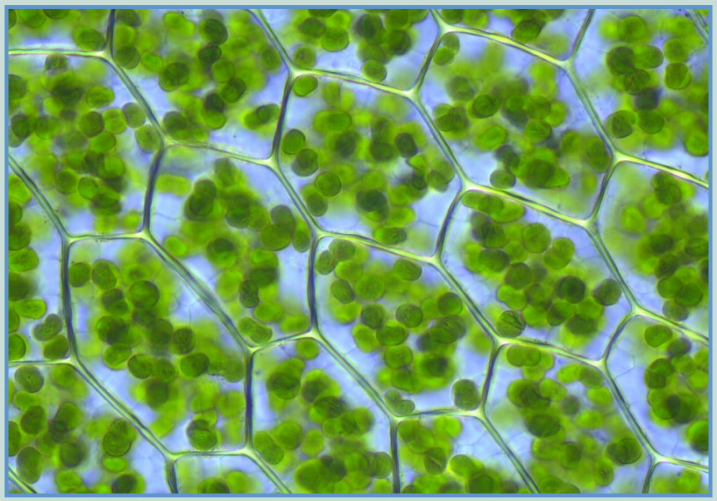
Fun with presence/absence data

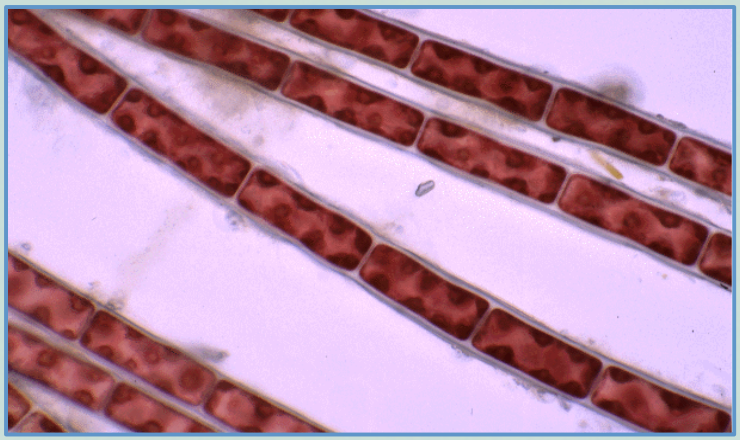
Barbara Schönfeld

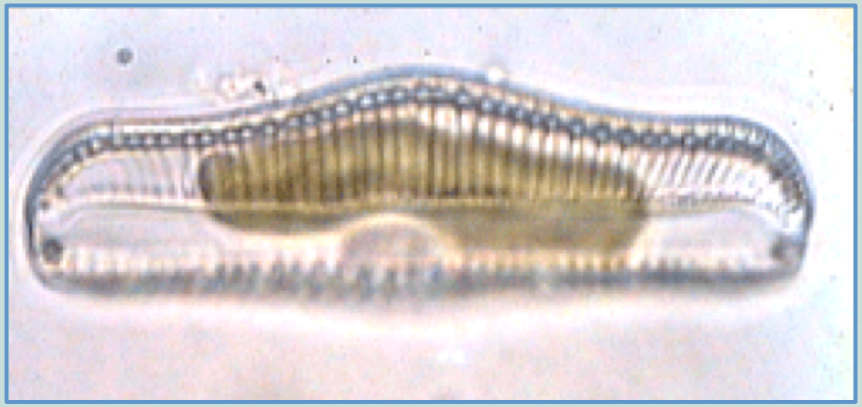
Photosynthesis



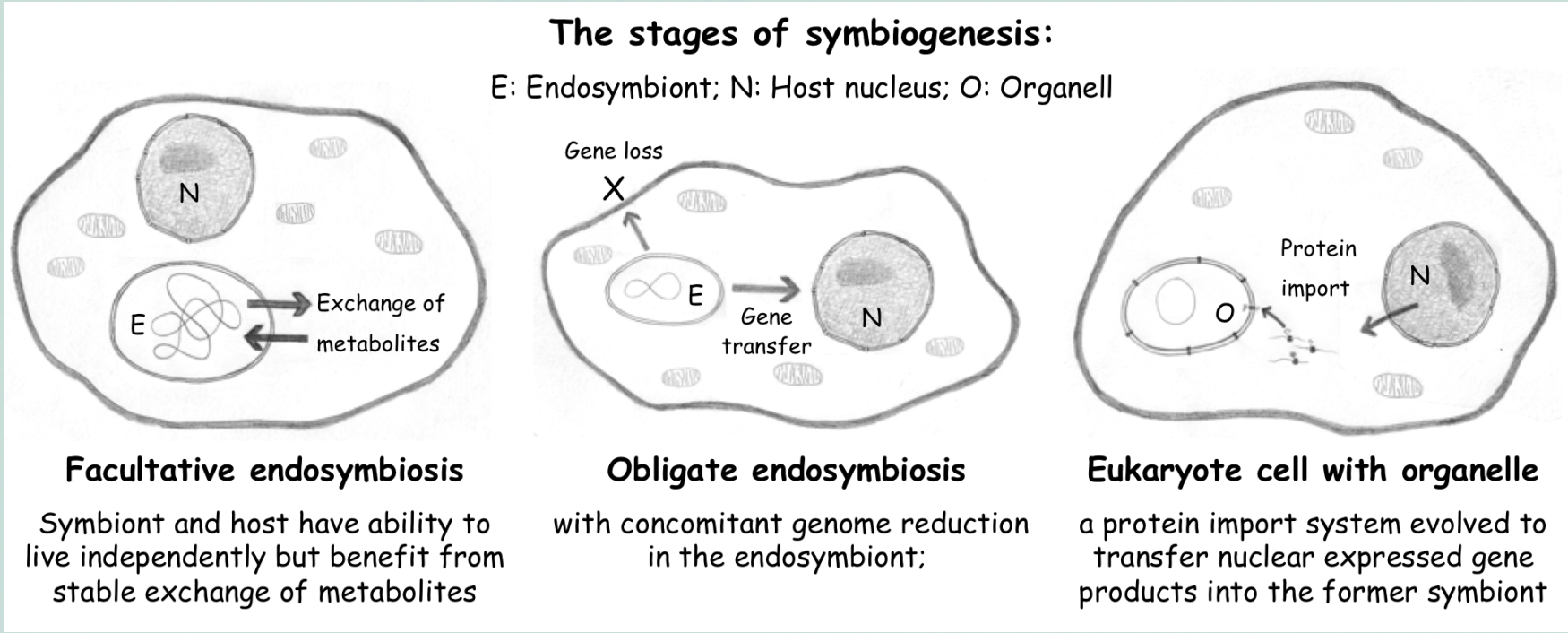
Plastids







Symbiogenesis



Plastid encoded proteins

~ 2000 different proteins are necessary to run a plastid

Contemporary plastid genomes encode 20 – 200 proteins, the rest is encoded in the nucleus and imported

Things you'd think we'd know

What is the nature of the selection pressure to reduce the plastid genome?

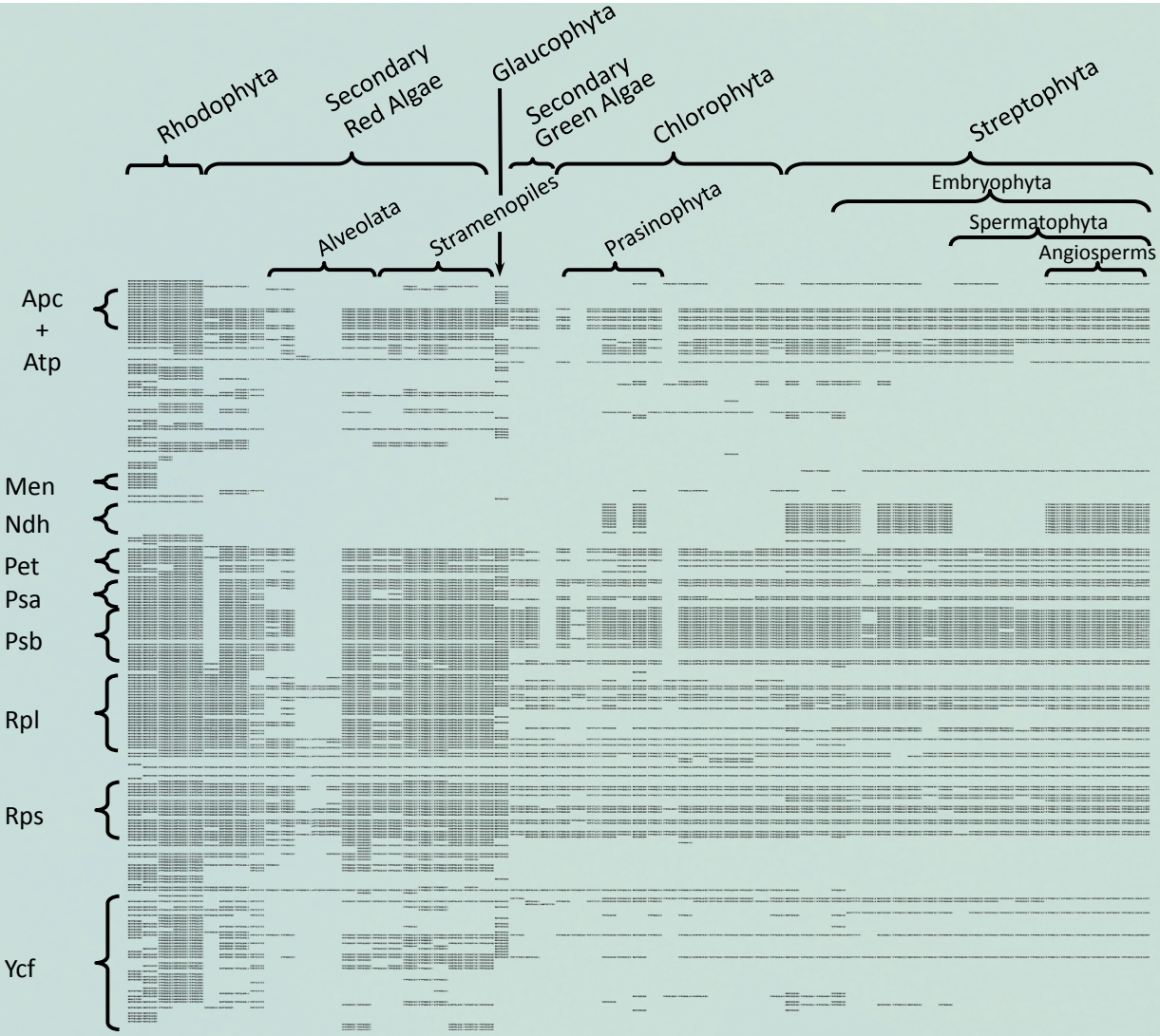
What keeps some genes in the plastid genome? Why are there plastid genomes left at all?

How prevalent are gene losses from the plastid genome?

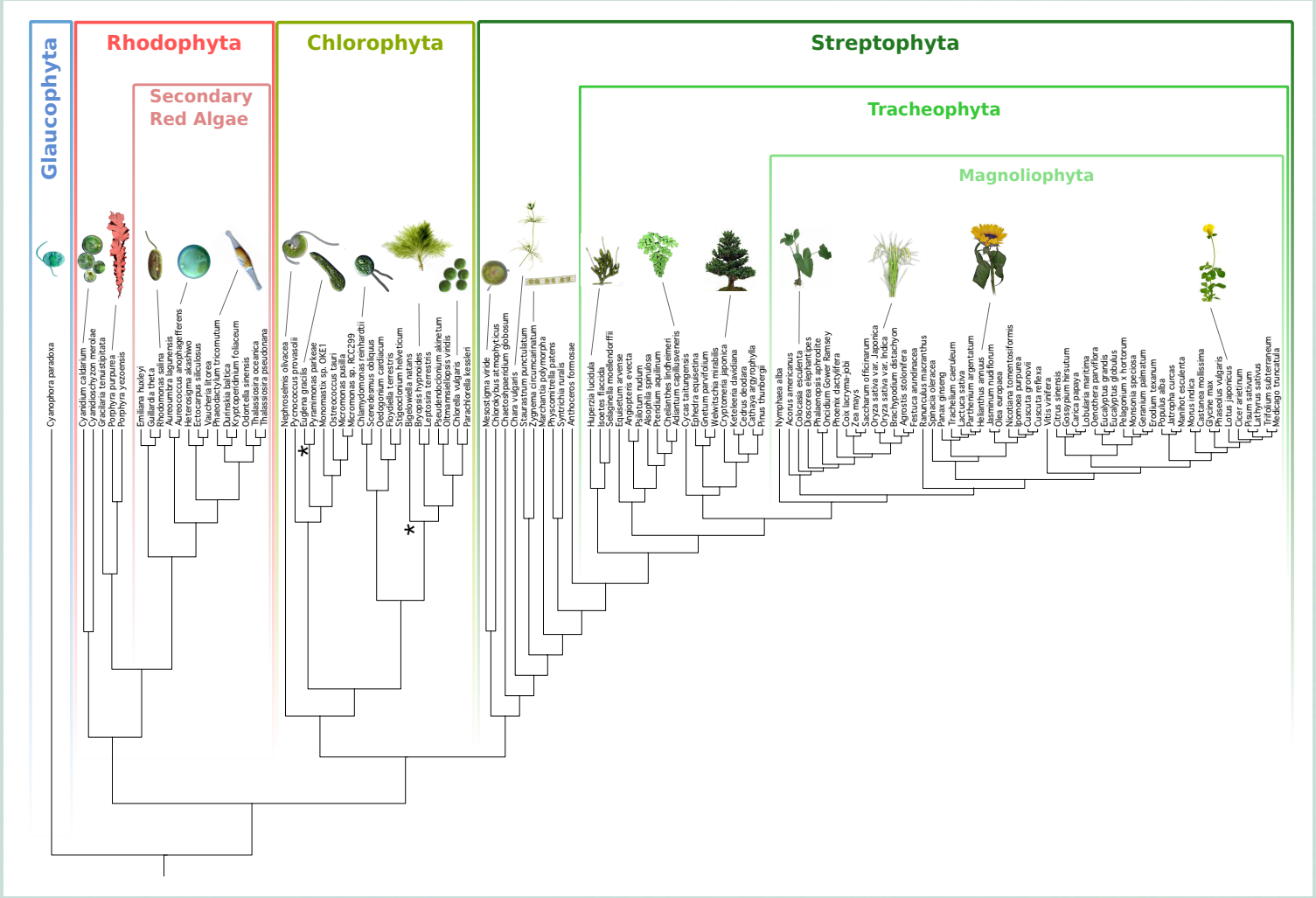
Is the loss of specific genes primarily driven by chance or selection pressures?

The data

196 Taxa
267 Genes

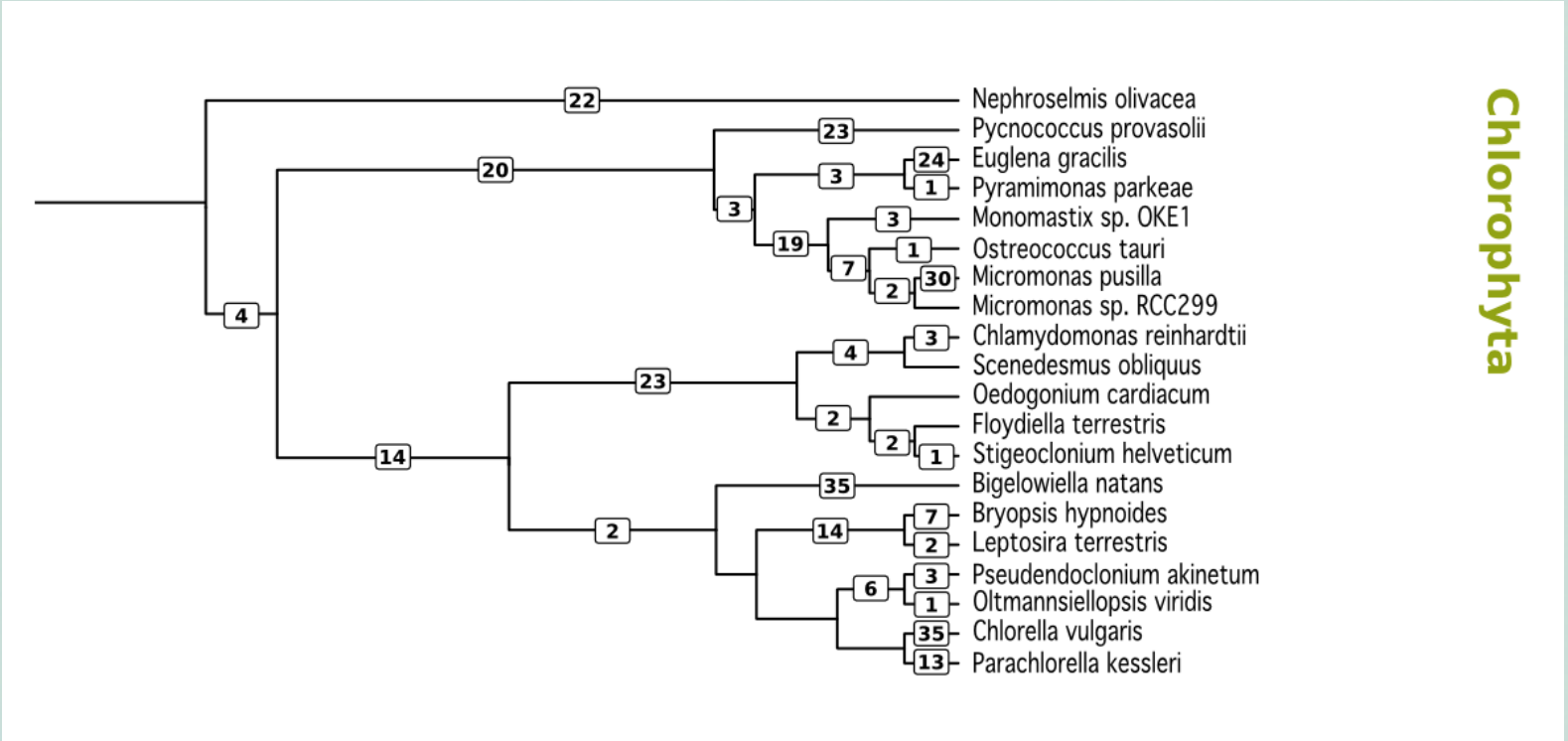


A plausible phylogeny for Dollo parsimony



Dollo parsimony results

Gene losses happen more frequently than expected by many biologists.
There are lineage specific patterns and stark differences in frequency.



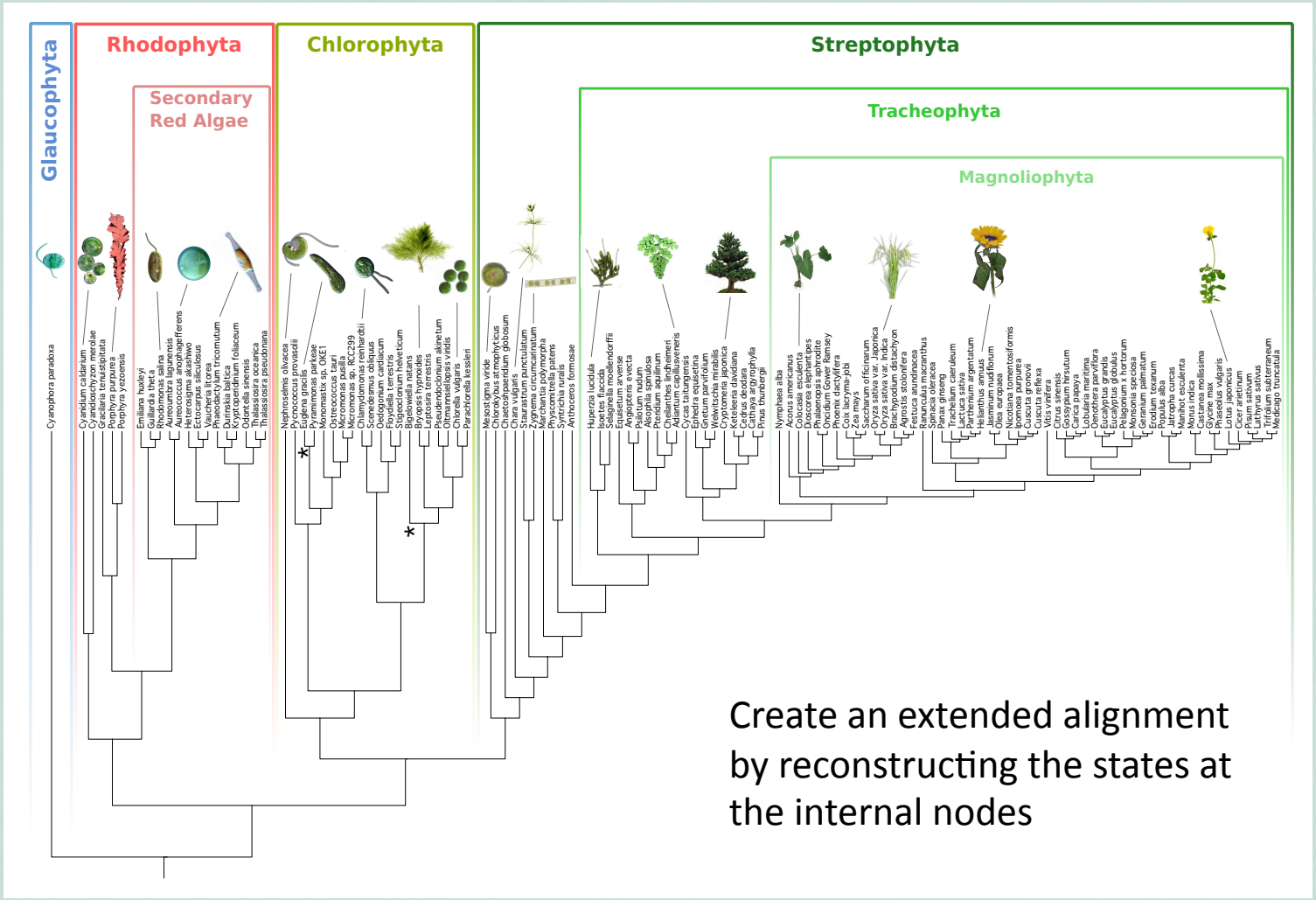
Was that it?

What frequency distribution should we expect to observe at random?

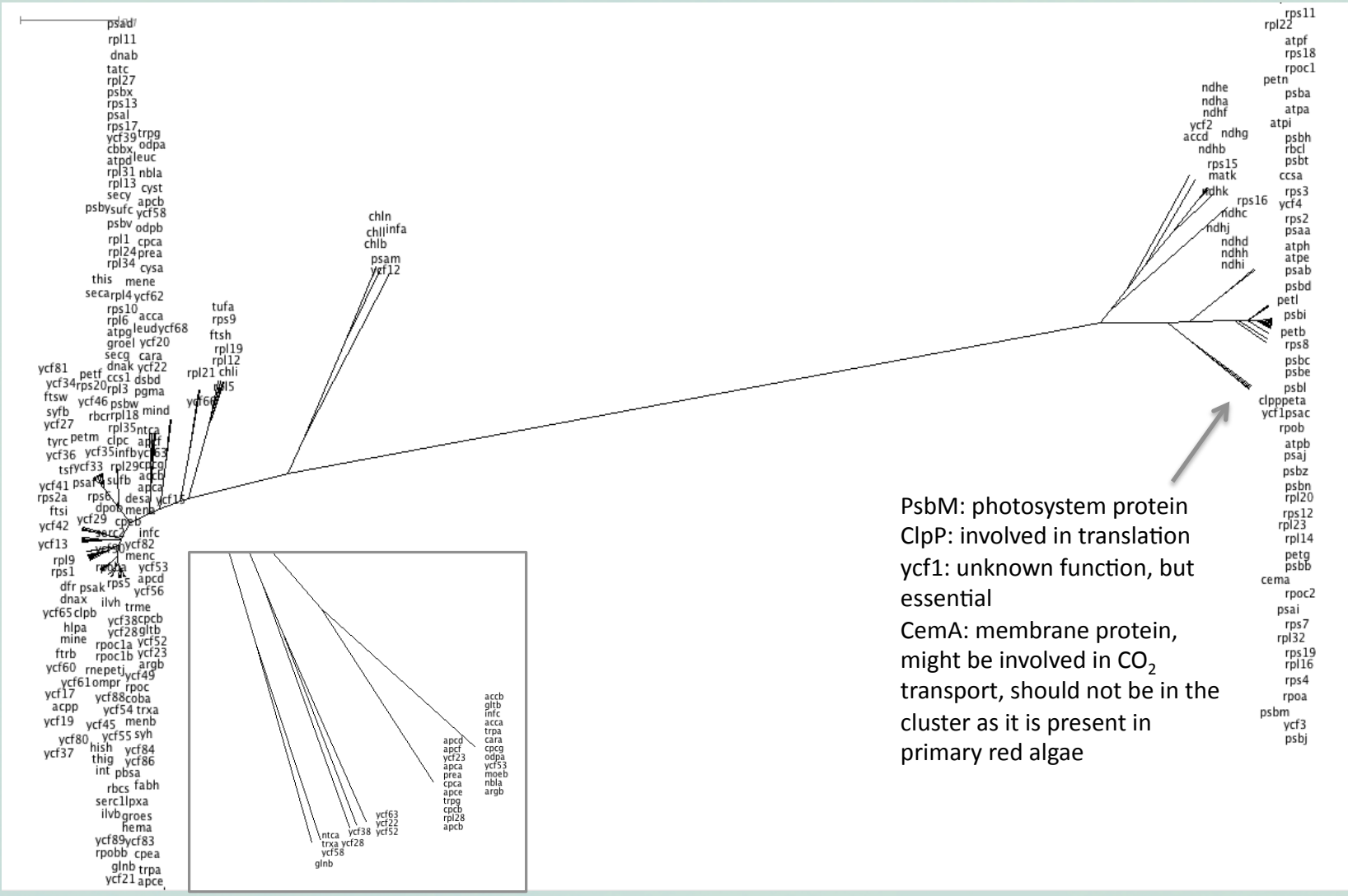
Does the loss of a specific gene change the probability of another gene being lost?

Do similarities in gene fate tell us anything about the underlying mechanisms?

Which genes share similar fates?



UPGMA of extended alignment



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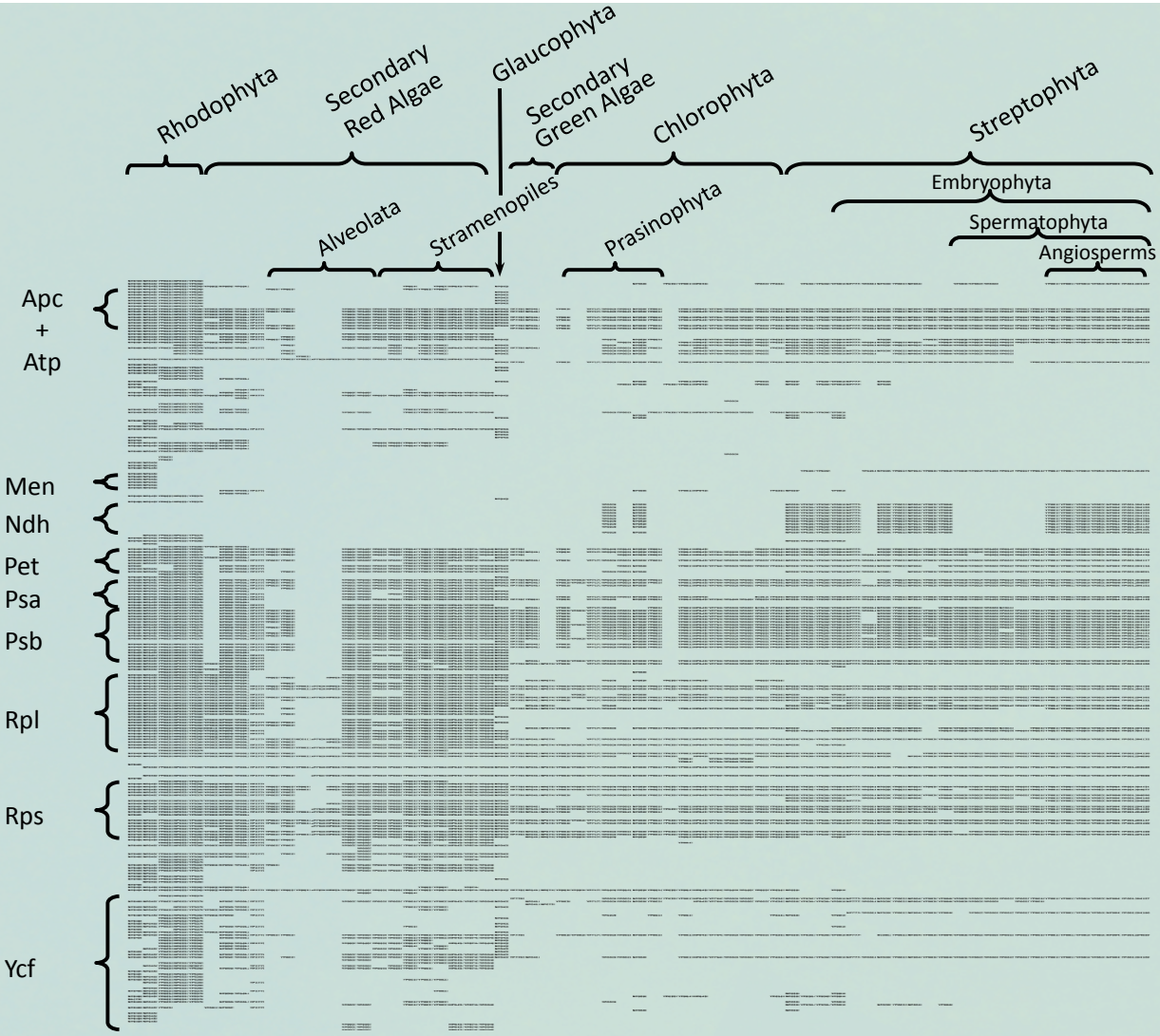

Acknowledgements

Thank you for listening!

I'd like to thank for their support:
Pete Lockhart
Bill Martin
Barbara Holland
Michael Woodhams
and
UTAS department of Math and Physics for hosting me